# Current session 07/11/2003

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Last connection: 17/10/03 15*02*53

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- LGST file reloaded for revised EPO coverage, see INFO LGST
- French Patent Applications Fulltext file, see INFO FRFULL
..FILE / ..INFO / ..GUIDE
```

### Query/Command : file tulsa

```
QUESTEL        - Time in minutes :   1,10
The cost estimation below is based on Questel's
standard price list
                              Estimated cost :    1.02 USD
Cost estimated for the last database search :    1.02 USD
Estimated total session cost                :    1.02 USD

Selected file: TULSA

 YOU ARE NOW CONNECTED TO TULSA
 COVERS 1965 THRU WEEKLY UPDATE 2003-44
 For further information, type ..INFO TULSA.
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 Search statement    1
```

### Query/Command : nbr inn/ Blanch joakim

```
Displaying  /BI
```

| | | |
|---|---|---|
| 1 | 1 | INMISCIBLES |
| 2 | 1 | INMMISCIBLE |
| 3 | 2 | INMOD |
| 4 | 1 | INMOS |
| 5 | 14 | INN |
| 6 | 1 | INNA |
| 7 | 1 | INNACCURATE |
| 8 | 1 | INNAECOELIDA |
| 9 | 1 | INNAGE |
| 10 | 3 | INNAI |
| 11 | 1 | INNAMINACKA |
| 12 | 1 | INNAMINCK |
| 13 | 10 | INNAMINCKA |
| 14 | 13 | INNATE |
| 15 | 1 | INNATELY |

```
Some: numbers / Continue: Y / None: N
```

**Query/Command : nbr /inn blanch joakim**

```
Displaying   /Aun

1       2    BLANC, R
2       1    BLANC, S
3       1    BLANCAL, C
4       1    BLANCARD, J
5       1    BLANCETT, J H
6       2    BLANCH, H W
7       3    BLANCH, J
8       3    BLANCH, J E
9      18    BLANCH, J O
10      1    BLANCH, M
11      1    BLANCHARD-WILLIAMSON, M C
12      4    BLANCHARD, A
13      1    BLANCHARD, A D H
14      8    BLANCHARD, A J
15      1    BLANCHARD, A L

Some: numbers / Continue: Y / None: N
```

**Query/Command : 9**

```
** SS 1: Results 18

Continue: Y / N
```

**Query/Command : prt 1-18 ti**

---

*1 / 18   TULSA - ©TULS*

**TI**   -   ACOUSTIC LOGGING APPARATUS AND METHOD FOR ANISOTROPIC
EARTH FORMATIONS

---

*2 / 18   TULSA - ©TULS*

**TI**   -   A METHOD TO EXTRACT FAST AND SLOW SHEAR WAVE VELOCITIES
IN AN ANISOTROPIC FORMATION

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*3 / 18   TULSA - ©TULS*

**TI**   -   (R) PROCESSING FOR SONIC WAVEFORMS

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*4 / 18   TULSA - ©TULS*

**TI**   -   PROCESSING FOR SONIC WAVEFORMS

*5 / 18   TULSA - ©TULS*

**TI**    -    A SIMPLIFIED LAX-WENDROFF CORRECTION FOR STAGGERED- GRID
              FDTD (FINITE-DIFFERENCE TIME-DOMAIN) MODELING OF
              ELECTROMAGNETIC WAVE PROPAGATION IN FREQUENCY-
              DEPENDENT MEDIA

*6 / 18   TULSA - ©TULS*

**TI**    -    INVERSION AND AVO IN ATTENUATING MEDIA

*7 / 18   TULSA - ©TULS*

**TI**    -    IMPROVING MODELING OF WAVE PROPAGATION IN VISCOELASTIC
              MEDIA

*8 / 18   TULSA - ©TULS*

**TI**    -    AN ACCURATE AND EFFICIENT FINITE-DIFFERENCE SOLUTION OF
              MAXWELL'S EQUATIONS FOR GROUND- PENETRATING RADAR
              MODELING

*9 / 18   TULSA - ©TULS*

**TI**    -    A MODIFIED LAX-WENDROFF CORRECTION FOR WAVE
              PROPAGATION IN MEDIA DESCRIBED BY ZENER ELEMENTS

*10 / 18   TULSA - ©TULS*

**TI**    -    MODELING, INVERSION AND IMAGING OF SEISMIC DATA IN VISCOUS
              MEDIA

*11 / 18   TULSA - ©TULS*

**TI**    -    EFFICIENT ITERATIVE VISCOACOUSTIC LINEARIZED INVERSION

*12 / 18   TULSA - ©TULS*

**TI**    -    MODELING OF A CONSTANT Q: METHODOLOGY AND ALGORITHM
              FOR AN EFFICIENT AND OPTIMALLY INEXPENSIVE VISCOELASTIC
              TECHNIQUE

*13 / 18   TULSA - ©TULS*

**TI**    -    CONSTANT Q MODELING: PRELIMINARY RESULTS FOR A NEW
              ALGORITHM

*14 / 18   TULSA - ©TULS*

**TI**    -    LINEAR INVERSION IN LAYERED VISCOACOUSTIC MEDIA USING A
              TIME-DOMAIN METHOD

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*15 / 18   TULSA - ©TULS*

**TI**    -    VISCOELASTIC FINITE-DIFFERENCE MODELING

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*16 / 18   TULSA - ©TULS*

**TI**    -    2-D AND 3-D VISCOELASTIC FINITE DIFFERENCE MODELING

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*17 / 18   TULSA - ©TULS*

**TI**    -    3-D VISCOELASTIC FINITE-DIFFERENCE MODELING

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*18 / 18   TULSA - ©TULS*

**TI**    -    VISCOELASTIC FINITE-DIFFERENCE MODELING

**Query/Command : prt 1 3 4 fu**

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*1 / 18   TULSA - ©TULS*

**AN**    -    820806

**TI**    -    ACOUSTIC LOGGING APPARATUS AND METHOD FOR ANISOTROPIC
              EARTH FORMATIONS

**AU**    -    BLANCH, J O; VARSAMIS, G

**OS**    -    HALLIBURTON ENERGY SERVICE

**SO**    -    EUROPE 1,324,076A2, P 2003.07.02, F 2002.12.09, PR US 2001.12.19 (APPL
              25,157) AND US 2001.12.21 (APPL 27,749) (G01V-001/48) (20 PP; 57
              CLAIMS)

**LA**    -    ENGLISH; (ENG)

**DT**    -    (P) PATENT

**PN**    -    EP1324076 A2

**PD**    -    2003-07-02

**AP**    -    20021209

**PR**    -    US25157 20011219 [2001US-0025157]
              US27749 20011221 [2001US-0027749]

**IC**    -    G01V-001/48

**IT**    -    SONIC LOGGING*; ELASTIC WAVE*; ELASTIC WAVE LOGGING*;
              FORMATION EVALUATION*; INTERPRETATION*; PHYSICAL
              PROPERTY*; SHEAR WAVE*; SHEAR WAVE VELOCITY*; VELOCITY*;
              WAVE*; WAVE PROPERTY*; WAVE VELOCITY*; WAVEFORM*; WELL

LOG INTERPRETATION*; WELL LOGGING*; ACOUSTIC RECEIVER; ACOUSTICS; ANISOTROPY; APPROXIMATION; AZIMUTH; CHARACTERIZATION; CHART; CLASSIFICATION; COMPOSITE WAVE; COMPOSITION; COMPUTING; DATA PROCESSING; DENSITY; DETECTION; DETECTOR; DIAGRAM; DIPOLE; ELECTRICAL EQUIPMENT; ELECTRONIC EQUIPMENT; EQUATION; GEOLOGIC STRUCTURE; GRAPH; HALLIBURTON ENERGY SERVICE; HETEROGENEOUS RESERVOIR; INSTRUMENT; ISOTROPY; MATHEMATICAL ANALYSIS; MATHEMATICAL MODEL; MATHEMATICS; MODEL; ORIENTATION; POLARIZATION; RECEIVER (ELECTRONIC); REMOTE SENSING; REMOTE SENSOR; RESERVOIR; RESERVOIR CHARACTERIZATION; ROCK COMPOSITION; ROCK DENSITY; SEISMIC WAVE; SEISMIC WAVE SOURCE; SHEAR WAVE SOURCE; SONDE; SOUND WAVE; SOUND WAVE SOURCE; WAVE SOURCE; WELL LOG; WELL LOGGING EQUIPMENT; WELLBORE DIAGRAM

**MH** - SONIC LOGGING*

**CC** - WELL LOGGING & SURVEYING

**AB** - A signal processing technique is described for determining the fast and slow shear wave polarizations and their orientation for acoustic waves in an anisotropic earth formation. The signal processing method decomposes composite received waveforms a number of times, using a number of different strike angles. The decomposed signals are used to create estimated source signals. The estimated source signals are compared in some way to obtain an objective function. Locations in a plot where the objective function reaches minimum values are indicative of the acoustic velocity of the fast and slow polarizations within the formation.

**PY** - 2003

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*3 / 18  TULSA - ©TULS*

| | | |
|---|---|---|
| **AN** | - | 798115 |
| **TI** | - | (R) PROCESSING FOR SONIC WAVEFORMS |
| **AU** | - | BLANCH, J O; HOLMQUIST, S G; MARKET, J A; VARSAMIS, G L |
| **SO** | - | US 6,453,240B1, C 2002.09.17, F 2000.04.11, PR US 1999.04.12 (APPL 60/128,912) (G01R-001/48) (28 PP; 21 CLAIMS) SRPA# 748,847 |
| **LA** | - | ENGLISH; (ENG) |
| **DT** | - | (P) PATENT |
| **PN** | - | US6453240 B1 |
| **PD** | - | 2002-09-17 |
| **AP** | - | 20000411 |
| **PR** | - | US 60/128,912 19990412 [1999US-P128912] |
| **IC** | - | G01R-001/48 |
| **IT** | - | SONIC LOGGING*; ELASTIC WAVE LOGGING*; WELL LOGGING* |
| **MH** | - | SONIC LOGGING* |
| **CC** | - | WELL LOGGING & SURVEYING |
| **AB** | - | (For abstract and indexing, see Abstract #748,847) |
| **PY** | - | 2002 |
| **XR** | - | 748847 |

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*4 / 18  TULSA - ©TULS*

| | | |
|---|---|---|
| **AN** | - | 748847 |
| **TI** | - | PROCESSING FOR SONIC WAVEFORMS |
| **AU** | - | BLANCH, J O; HOLMQUIST, S G; MARKET, J A; VARSAMIS, G L |
| **OS** | - | HALLIBURTON ENERGY SERVICE |
| **SO** | - | WORLD 00/62,101, P 2000.10.19, F 2000.04.12, PR US 1999.04.12 (APPL 60/128,912) (G01V-001/48) (39 PP; 27 CLAIMS) |
| **LA** | - | ENGLISH; (ENG) |
| **DT** | - | (P) PATENT |
| **PN** | - | WO200062101 |
| **PD** | - | 2000-10-19 |
| **AP** | - | 20000412 |
| **PR** | - | US 60/128,912 19990412 [1999US-P128912] |
| **IC** | - | G01V-001/48 |
| **IT** | - | SONIC LOGGING*; ACOUSTIC RECEIVER*; DOMAIN*; ELASTIC WAVE*; ELASTIC WAVE LOGGING*; ELECTRICAL EQUIPMENT*; ELECTRONIC EQUIPMENT*; INTERPRETATION*; MATHEMATICS*; PHYSICAL PROPERTY*; RECEIVER (ELECTRONIC)*; SOUND WAVE*; TIME DOMAIN*; WAVE*; WAVE PROPERTY*; WAVEFORM*; WELL |

LOG INTERPRETATION*; WELL LOGGING*; ACOUSTIC PROPERTY; ACOUSTICS; CALCULATING; CHANGE; CHART; COMPUTER STORAGE; DATA; DATA ANALYSIS; DATA IMPROVEMENT; DATA PROCESSING; DATA STORAGE; DETECTION; DETECTOR; DIAGRAM; EQUATION; FILTER (ELECTRICAL); FILTERING (ELECTRICAL); FOURIER ANALYSIS; FOURIER TRANSFORM; FREQUENCY; FREQUENCY DOMAIN; FUNCTION (MATHEMATICS); HALLIBURTON ENERGY SERVICE; IMPROVEMENT; INSTRUMENT; MATHEMATICAL ANALYSIS; MATHEMATICAL MODEL; MODEL; PROBABILITY; RECIPROCAL FUNCTION; REMOTE SENSING; REMOTE SENSOR; SIGNAL; SONDE; SOUND VELOCITY; SOUND WAVE SOURCE; STATISTICAL ANALYSIS; TRANSMISSION (DATA); TRANSMITTER; TRANSMITTING; VELOCITY; WAVE FREQUENCY; WAVE SOURCE; WAVE VELOCITY; WELL LOG; WELL LOGGING DATA; WELL LOGGING EQUIPMENT; WELLBORE DIAGRAM

**MH** - SONIC LOGGING*

**CC** - WELL LOGGING & SURVEYING

**AB** - A method is described for creating a frequency or time domain semblance for use in conjunction with acoustic logging tools. The frequency domain semblance may be obtained by transforming an acoustic signal received at multiple depths into the frequency domain, combining the received waveforms corresponding to the different depths, and expressing the result in a graph with slowness and frequency axes. Another aspect is the treatment of 2 or more time-domain semblances as probability-density functions of the slowness for an acoustic signal. This enables the combination of time-domain semblances from the same depth in the well bore. Once combined, the time-domain semblances more accurately depict the slowness of an acoustic wave through the formation at the selected depth. In addition, a related self-adaptation method to compress the waveform data down hole for storage or transmission is also described.

**PY** - 2000

**Query/Command : 7**

** SS 2: Results 19.893

Search statement    3

**Query/Command : ss 7**

| Frequency | Term |
|-----------|------|
| 216 | SS |
| 19893 | 7 |

** SS 3: Results 0

Search statement    4

**Query/Command : estimat??? 1w source 1w wave????**

```
Frequency    Term
    76899    SOURCE
    51142    ESTIMAT???
   130927    WAVE????
```

## ** SS 4: Results 8

Search statement    5

### Query/Command : prt 1-8 ti

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*1 / 8   TULSA - ©TULS*

**TI**    -    APPLICATION OF ACOUSTIC FULL-WAVE TOMOGRAPHY TO FIELD
DATA

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*2 / 8   TULSA - ©TULS*

**TI**    -    PREDICTION OF THE WAVEFIELD ANYWHERE ABOVE AN ORDINARY
TOWED STREAMER: APPLICATION TO SOURCE WAVEFORM
ESTIMATION, DEMULTIPLE, DEGHOSTING, DATA RECONSTRUCTION
AND IMAGING

---

*3 / 8   TULSA - ©TULS*

**TI**    -    DEEP-WATER MULTIPLE SUPPRESSION IN THE NEAR-OFFSET RANGE

---

*4 / 8   TULSA - ©TULS*

**TI**    -    ADAPTIVE MINIMUM PREDICTION-ERROR DECONVOLUTION AND
SOURCE WAVELET ESTIMATION USING HOPFIELD NEURAL
NETWORKS

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*5 / 8   TULSA - ©TULS*

**TI**    -    SOURCE WAVELET AND ITS ANGULAR SPECTRUM FROM PLANE-
WAVE SEISMOGRAMS

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*6 / 8   TULSA - ©TULS*

**TI**    -    MONTE CARLO **ESTIMATION** OF **SOURCE WAVELETS** AND
REFLECTIVITY SERIES

*7 / 8  TULSA - ©TULS*

**TI** - SIMULTANEOUS DETERMINATION OF SOURCE WAVELET AND
VELOCITY PROFILE USING IMPULSIVE POINT-SOURCE REFLECTIONS
FROM A LAYERED FLUID

*8 / 8  TULSA - ©TULS*

**TI** - METHOD AND SYSTEM FOR REMOVING THE EFFECT OF THE SOURCE
WAVELET FROM SEISMIC DATA

**Query/Command : 1 fu**

```
Frequency    Term
   81120  1
      16  FU
```

** SS 5: Results 0

Search statement    6

**Query/Command : his**

```
File : TULSA

SS   Results
  1        18   ..INDEX /Aun
                BLANCH, J O
  2     19893   7
  3         0   SS 7
  4         8   ESTIMAT??? 1W   SOURCE 1W WAVE????
  5         0   1 FU
```

Search statement    6

**Query/Command : prt ss 4 1**

*1 / 8  TULSA - ©TULS*

**AN** - 810462

**TI** - APPLICATION OF ACOUSTIC FULL-WAVE TOMOGRAPHY TO FIELD
DATA

**AU** - TAKASE, S; WATANABE, T; MATSUOKA, T; ASHIDA, Y; YABUUCHI, S

**OS** - OYO CORP; KYOTO UNIV; JAPAN NUCL CYCLE DEV INST

**SO** - BUTSURI-TANSA V 55, NO 5, PP 375-385, OCT 2002 (COLOR; 11 REFS; IN
JAPANESE)

**LA** - JAPANESE; (JPN); NON-ENGLISH; (XE)

**Query/Command : his**

File : TULSA

```
SS  Results
  1      18   ..INDEX /Aun
              BLANCH, J O
  2   19893   7
  3       0   SS 7
  4       8   ESTIMAT??? 1W   SOURCE 1W WAVE????
  5       0   1 FU
```

Search statement    6


### Query/Command : compar???? 2d estimat??? 2d source 2d wave????

```
Frequency    Term
   76899   SOURCE
   72228   COMPAR????
   51142   ESTIMAT???
  130927   WAVE????
```


** SS 6: Results 0

Search statement    7


### Query/Command : compar???? s estimat??? s source s wave????

```
Frequency    Term
   76899   SOURCE
   72228   COMPAR????
   51142   ESTIMAT???
  130927   WAVE????
```


## ** SS 7: Results 4

Search statement    8


### Query/Command : compar??? s estimat??? s source

```
Frequency    Term
   76899   SOURCE
   28427   COMPAR???
   51142   ESTIMAT???
```


## ** SS 8: Results 20

Search statement    9


### Query/Command : prt 1-20 ti

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*1 / 20  TULSA - ©TULS*

**TI** -     ACOUSTIC LOGGING APPARATUS AND METHOD FOR ANISOTROPIC
            EARTH FORMATIONS

*2 / 20  TULSA - ©TULS*

**TI** - ON THE SLOW DRAINING OF A GRAVITY CURRENT MOVING THROUGH A LAYERED PERMEABLE MEDIUM

*3 / 20  TULSA - ©TULS*

**TI** - ELIMINATION OF FREE-SURFACE RELATED MULTIPLES WITHOUT NEED OF THE SOURCE WAVELET

*4 / 20  TULSA - ©TULS*

**TI** - THE NATIH PETROLEUM SYSTEM OF NORTH OMAN

*5 / 20  TULSA - ©TULS*

**TI** - ELIMINATION OF FREE SURFACE-RELATED MULTIPLES WITHOUT NEED OF THE SOURCE WAVELET

*6 / 20  TULSA - ©TULS*

**TI** - VARIOGRAM ANALYSIS OF HELICOPTER MAGNETIC DATA TO IDENTIFY PALEOCHANNELS OF THE OMARURU RIVER, NAMIBIA

*7 / 20  TULSA - ©TULS*

**TI** - PALAEOMAGNETIC ANALYSIS OF FOLD CLOSURE GROWTH AND VOLUMETRICS

*8 / 20  TULSA - ©TULS*

**TI** - AN EXPERIMENTAL COMPARISON OF THREE DIRECT METHODS OF MARINE SOURCE SIGNATURE ESTIMATION

*9 / 20  TULSA - ©TULS*

**TI** - INVERSION OF THE POWER SPECTRUM FROM GRAVITY ANOMALIES OF PRISMATIC BODIES

*10 / 20  TULSA - ©TULS*

**TI** - GENETIC CLASSIFICATION OF PETROLEUM SYSTEMS USING THREE FACTORS: CHARGE, MIGRATION, AND ENTRAPMENT

*11 / 20  TULSA - ©TULS*

**TI** - SOURCE SIGNATURE DETERMINATION FROM MINISTREAMER DATA

*12 / 20  TULSA - ©TULS*

**TI** - MULTI-OFFSET ACOUSTIC INVERSION OF A LATERALLY INVARIANT MEDIUM : APPLICATION TO REAL DATA

*13 / 20  TULSA - ©TULS*

**TI** - FLUME CONFINEMENT EFFECT ON WAVE-INDUCED DYNAMIC PRESSURES ON TWIN-TANDEM CYLINDERS

*14 / 20  TULSA - ©TULS*

**TI** - THE HYDROCARBON SOURCE POTENTIAL OF BRAZIL AND WEST AFRICA SALT BASINS : A MULTIDISCIPLINARY APPROACH

*15 / 20  TULSA - ©TULS*

**TI** - GENETIC CLASSIFICATION OF PETROLEUM SYSTEMS

*16 / 20  TULSA - ©TULS*

**TI** - A NEW METHOD FOR THE MEASUREMENT OF KINETIC PARAMETERS OF HYDROCARBON GENERATION FROM SOURCE ROCKS

*17 / 20  TULSA - ©TULS*

**TI** - MIGRATION OF OIL AND GAS IN THE MAHAKAM DELTA, KALIMANTAN : EVIDENCE AND QUANTITATIVE ESTIMATE FROM ISOTOPE AND BIOMARKER STUDIES

*18 / 20  TULSA - ©TULS*

**TI** - SEDIMENTARY "SIGNATURES" OF FORELAND BASIN ASSEMBLAGES : REAL OR COUNTERFEIT?

*19 / 20  TULSA - ©TULS*

**TI** - CONCEPTS FOR ESTIMATING HYDROCARBON ACCUMULATION AND DISPERSION

*20 / 20   TULSA - ©TULS*

**TI**    -    DEVONIAN SHALE

**Query/Command : prt 1 8 11 fu**

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*1 / 20   TULSA - ©TULS*

| | | |
|---|---|---|
| **AN** | - | 820806 |
| **TI** | - | ACOUSTIC LOGGING APPARATUS AND METHOD FOR ANISOTROPIC EARTH FORMATIONS |
| **AU** | - | BLANCH, J O; VARSAMIS, G |
| **OS** | - | HALLIBURTON ENERGY SERVICE |
| **SO** | - | EUROPE 1,324,076A2, P 2003.07.02, F 2002.12.09, PR US 2001.12.19 (APPL 25,157) AND US 2001.12.21 (APPL 27,749) (G01V-001/48) (20 PP; 57 CLAIMS) |
| **LA** | - | ENGLISH; (ENG) |
| **DT** | - | (P) PATENT |
| **PN** | - | EP1324076 A2 |
| **PD** | - | 2003-07-02 |
| **AP** | - | 20021209 |
| **PR** | - | US25157 20011219 [2001US-0025157] <br> US27749 20011221 [2001US-0027749] |
| **IC** | - | G01V-001/48 |
| **IT** | - | SONIC LOGGING*; ELASTIC WAVE*; ELASTIC WAVE LOGGING*; FORMATION EVALUATION*; INTERPRETATION*; PHYSICAL PROPERTY*; SHEAR WAVE*; SHEAR WAVE VELOCITY*; VELOCITY*; WAVE*; WAVE PROPERTY*; WAVE VELOCITY*; WAVEFORM*; WELL LOG INTERPRETATION*; WELL LOGGING*; ACOUSTIC RECEIVER; ACOUSTICS; ANISOTROPY; APPROXIMATION; AZIMUTH; CHARACTERIZATION; CHART; CLASSIFICATION; COMPOSITE WAVE; COMPOSITION; COMPUTING; DATA PROCESSING; DENSITY; DETECTION; DETECTOR; DIAGRAM; DIPOLE; ELECTRICAL EQUIPMENT; ELECTRONIC EQUIPMENT; EQUATION; GEOLOGIC STRUCTURE; GRAPH; HALLIBURTON ENERGY SERVICE; HETEROGENEOUS RESERVOIR; INSTRUMENT; ISOTROPY; MATHEMATICAL ANALYSIS; MATHEMATICAL MODEL; MATHEMATICS; MODEL; ORIENTATION; POLARIZATION; RECEIVER (ELECTRONIC); REMOTE SENSING; REMOTE SENSOR; RESERVOIR; RESERVOIR CHARACTERIZATION; ROCK COMPOSITION; ROCK DENSITY; SEISMIC WAVE; SEISMIC WAVE SOURCE; SHEAR WAVE SOURCE; SONDE; SOUND WAVE; SOUND WAVE SOURCE; WAVE SOURCE; WELL LOG; WELL LOGGING EQUIPMENT; WELLBORE DIAGRAM |
| **MH** | - | SONIC LOGGING* |
| **CC** | - | WELL LOGGING & SURVEYING |

AB   -    A signal processing technique is described for determining the fast and slow shear wave polarizations and their orientation for acoustic waves in an anisotropic earth formation. The signal processing method decomposes composite received waveforms a number of times, using a number of different strike angles. The decomposed signals are used to create estimated source signals. The **estimated source** signals are **compared** in some way to obtain an objective function. Locations in a plot where the objective function reaches minimum values are indicative of the acoustic velocity of the fast and slow polarizations within the formation.

PY   -    2003

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*8 / 20   TULSA - ©TULS*

AN   -    617612

TI    -    AN EXPERIMENTAL COMPARISON OF THREE DIRECT METHODS OF MARINE SOURCE SIGNATURE ESTIMATION

AU   -    LAWS, R; LANDRO, M; AMUNDSEN, L

OS   -    SCHLUMBERGER CAMBRIDGE RES; IKU PETROLEUM RESEARCH; NORWEGIAN STATE OIL CO

SO   -    57TH EAGE CONF (GLASGOW, SCOT, 95.05.29-6/2/95) EXTENDED ABSTR PAP NO B027 V 1, 1995 (ISBN 90-73781-06-X; 2 PP; 4 REFS; ABSTRACT ONLY) (AO)

NU   -    ISBN 907378106X

LA   -    ENGLISH; (ENG)

DT   -    (A) MEETING PAPER ABSTRACT

IT    -    SEISMIC WAVE SOURCE*; ARRAY*; DATA PROCESSING*; EXPLORATION*; GEOPHYSICAL EXPLORATION*; MARINE EXPLORATION*; PATTERN*; PHYSICAL PROPERTY*; SEISMIC DATA PROCESSING*; SEISMIC EXPLORATION*; SEISMIC REFLECTION METHOD*; WAVE PROPERTY*; WAVE SOURCE*; WAVEFORM*; BUBBLE; GEOPHYSICAL EQUIPMENT; MULTIPLE REFLECTION; PULSE; REFLECTION (SEISMIC); SECONDARY REFLECTION; SEISMIC EQUIPMENT; SEISMIC PULSE; SEISMIC STREAMER; SEISMIC WAVE PROPAGATION; WAVE PHENOMENON; WAVE PROPAGATION

MH   -    SEISMIC WAVE SOURCE*

CC   -    GEOPHYSICS

AB   -    Three published methods for **estimating** the **source** signature of a marine seismic array are **compared** experimentally. In all 3 methods the fundamental assumption is that the bubbles in the array radiate as monopoles. The 3 methods use different approaches to estimate the source-functions of the monopoles, but all use the same method of computing the far field signature from the monopole source functions. The Ministreamer Bubble Inversion method is proprietary to Statoil. The method solves for monopole source functions that are solutions of the equation of motion of the pulsating bubbles in the array. The input data comes from a ministreamer under the source. The Ministreamer Monopole Inversion method is proprietary to Statoil. The method solves for arbitrary monopole source functions at the positions of the bubbles in the array. The input data comes from a

ministreamer under the source. The Near-field Monopole Inversion or Notional Source method is proprietary to Schlumberger. The method solves for arbitrary monopole source functions at the positions of the bubbles in the array. The input data comes from near-field hydrophones close to the airguns. (Longer abstract available) (Original article not available from T.U.)

**PY** - 1995

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*11 / 20 TULSA - ©TULS*

**AN** - 581716

**TI** - SOURCE SIGNATURE DETERMINATION FROM MINISTREAMER DATA

**AU** - LANDRO, M; LANGHAMMER, J; SOLLIE, R; AMUNDSEN, L; BERG, E

**OS** - IKU PETROLEUM RESEARCH; STATOIL RESEARCH CENTRE

**SO** - GEOPHYSICS V 59, NO 8, PP 1261-1269, AUG 1994 (17 REFS)

**NU** - ISSN 00168033

**LA** - ENGLISH; (ENG)

**IT** - WAVEFORM*; DATA PROCESSING*; EXPLORATION*; GEOPHYSICAL EQUIPMENT*; GEOPHYSICAL EXPLORATION*; MARINE EXPLORATION*; MATHEMATICAL ANALYSIS*; MATHEMATICS*; NUMERICAL INVERSION*; PHYSICAL PROPERTY*; SEISMIC DATA PROCESSING*; SEISMIC EQUIPMENT*; SEISMIC EXPLORATION*; SEISMIC REFLECTION METHOD*; SEISMIC STREAMER*; WAVE PROPERTY*; AIR GUN; ALGORITHM; AMPLITUDE VERSUS OFFSET; ARRAY; ATLANTIC OCEAN; BUBBLE; CHART; DATA; DATA ACQUISITION; DELTA FUNCTION; DIRECTIONAL RECEIVING; DIRECTIONAL WAVE SOURCE; ELECTRICAL EQUIPMENT; ELECTRONIC EQUIPMENT; EURASIA; EUROPE; FOURIER ANALYSIS; FUNCTION (MATHEMATICS); GEOPHYSICAL DATA; GRAPH; HYDROPHONE; INTERVAL VELOCITY; LEAST SQUARES; LINEAR; MATRIX ALGEBRA; MULTIPLE REFLECTION; NONLINEAR; NORTH ATLANTIC OCEAN; NORTH SEA; NORWAY; NUMERICAL ANALYSIS; OIL AND GAS FIELDS; OIL FIELD; OSEBERG OIL FIELD; PATTERN; PHASE BEHAVIOR; PHASE CHANGE; PHASE SHIFT; PULSE; RECORD; RECORDING; REFLECTION (SEISMIC); REFLECTION COEFFICIENT; REFLECTION RECORD; SEAS AND OCEANS; SECONDARY REFLECTION; SEISMIC DATA; SEISMIC PULSE; SEISMIC RECORD; SEISMIC RECORDING; SEISMIC VELOCITY; SEISMIC WAVE PROPAGATION; SEISMIC WAVE SOURCE; SOUND WAVE SOURCE; STATISTICAL ANALYSIS; TABLE (DATA); UNDERWATER SOUND SOURCE; VECTOR ANALYSIS; VELOCITY; WAVE PHENOMENON; WAVE PROPAGATION; WAVE SOURCE; WAVE VELOCITY

**MH** - WAVEFORM*

**CC** - GEOPHYSICS

**AB** - TWO METHODS FOR ESTIMATING THE PRESSURE WAVEFIELD GENERATED BY A MARINE AIR-GUN ARRAY ARE TESTED. DATA HAVE BEEN ACQUIRED AT A MINISTREAMER LOCATED BELOW THE SOURCE ARRAY. EFFECTIVE SOURCE SIGNATURES FOR EACH AIR

GUN ARE ESTIMATED. IN THE FIRST METHOD, A NONLINEAR
INVERSION ALGORITHM IS USED, WHERE THE FORWARD MODELING
SCHEME IS BASED UPON A PHYSICAL MODELING OF THE AIR
BUBBLE GENERATED BY EACH AIR GUN. IN THE SECOND METHOD,
A LINEAR INVERSION METHOD IS USED, WITH THE ASSUMPTION
THAT THE PHYSICS IN THE PROBLEM CAN BE DESCRIBED BY THE
ACOUSTIC WAVE EQUATION WITH EXPLOSIVE POINT SOURCES AS
THE DRIVING TERM. FROM THE **ESTIMATED** EFFECTIVE **SOURCE**
SIGNATURES, FAR-FIELD SIGNATURES HAVE BEEN CALCULATED
FOR BOTH METHODS AND **COMPARED** WITH MEASURED FAR-FIELD
SIGNATURES. THE ERROR ENERGY BETWEEN THE MEASURED AND
ESTIMATED FAR-FIELD SIGNATURES WAS APPROX. 8% FOR BOTH
METHODS.

**PY**   -   1994

## Query/Command : his

```
File : TULSA

SS   Results
  1          18   ..INDEX /Aun
                  BLANCH, J O
  2       19893   7
  3           0   SS 7
  4           8   ESTIMAT??? 1W   SOURCE 1W WAVE????
  5           0   1 FU
  6           0   COMPAR???? 2D ESTIMAT??? 2D SOURCE 2D WAVE????
  7           4   COMPAR???? S ESTIMAT??? S SOURCE S WAVE????
  8          20   COMPAR??? S ESTIMAT??? S SOURCE

Search statement   9
```

## Query/Command : estimat??? 3w source

```
Frequency   Term
   76899   SOURCE
   51142   ESTIMAT???
```

**\*\* SS 9: Results 170**

```
Search statement   10
```

## Query/Command : compar???

**\*\* SS 10: Results 27.550**

```
Search statement   11
```

## Query/Command : his

```
File : TULSA
```

```
SS  Results
  1        18  ..INDEX /Aun
              BLANCH, J O
  2     19893  7
  3         0  SS 7
  4         8  ESTIMAT??? 1W  SOURCE 1W WAVE????
  5         0  1 FU
  6         0  COMPAR???? 2D ESTIMAT??? 2D SOURCE 2D WAVE????
  7         4  COMPAR???? S ESTIMAT??? S SOURCE S WAVE????
  8        20  COMPAR??? S ESTIMAT??? S SOURCE
  9       170  ESTIMAT??? 3W SOURCE
 10     27550  COMPAR???

 Search statement  11
```

**Query/Command : 9 and 10**

## ** SS 11: Results 19

```
Search statement  12
```

**Query/Command : his**

```
File : TULSA

SS  Results
  1        18  ..INDEX /Aun
              BLANCH, J O
  2     19893  7
  3         0  SS 7
  4         8  ESTIMAT??? 1W  SOURCE 1W WAVE????
  5         0  1 FU
  6         0  COMPAR???? 2D ESTIMAT??? 2D SOURCE 2D WAVE????
  7         4  COMPAR???? S ESTIMAT??? S SOURCE S WAVE????
  8        20  COMPAR??? S ESTIMAT??? S SOURCE
  9       170  ESTIMAT??? 3W SOURCE
 10     27550  COMPAR???
 11        19  9 AND  10

 Search statement  12
```

**Query/Command : 4 or 8**

## ** SS 12: Results 28

```
Search statement  13
```

**Query/Command : 11 not 12**

## ** SS 13: Results 14

```
Search statement  14
```

**Query/Command : prt 1-14 ti**

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*1 / 14   TULSA - ©TULS*

**TI**   -    A COMPARISON OF SOME INTERPRETATION TECHNIQUES FOR
MAGNETIC DATA

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*2 / 14   TULSA - ©TULS*

**TI**   -    AN OPTIMIZATION OF THE INVERSE SCATTERING MULTIPLE
ATTENUATION METHOD FOR OBS (OCEAN-BOTTOM SEISMIC) AND
VC (VERTICAL CABLE) DATA

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*3 / 14   TULSA - ©TULS*

**TI**   -    AN OPTIMIZATION OF THE INVERSE SCATTERING MULTIPLE
ATTENUATION METHOD FOR OBS (OCEAN BOTTOM SEISMIC) AND
VC DATA

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*4 / 14   TULSA - ©TULS*

**TI**   -    SOURCE SIGNATURE DETERMINATION BY INVERSION OF
MINISTREAMER DATA

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*5 / 14   TULSA - ©TULS*

**TI**   -    SEISMIC VELOCITY ANALYSIS FOR MATURITY ASSESSMENT: UPPER
ASSAM BASIN, INDIA

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*6 / 14   TULSA - ©TULS*

**TI**   -    ESTIMATION OF THE SUBSURFACE REFLECTION COEFFICIENT USING
THE PRESTACK REVERSE-TIME DEPTH MIGRATION

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*7 / 14   TULSA - ©TULS*

**TI**   -    **ESTIMATION** OF **SOURCE** ROCK MATURITY BY RESISTIVITY

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*8 / 14   TULSA - ©TULS*

**TI**   -    ON TWO APPROACHES TO WAVE EQUATION BASED MULTIPLE
ATTENUATION

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*9 / 14   TULSA - ©TULS*

**TI**   -    SOLID STATE 13C NMR FOR CHARACTERISING SOURCE ROCKS

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*10 / 14  TULSA - ©TULS*

**TI**  -  **ESTIMATION** OF **SOURCE** ARRAY SIGNATURES

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*11 / 14  TULSA - ©TULS*

**TI**  -  AIRGUN SIGNATURE ESTIMATION AND WAVELET PROCESSING OF MARINE SEISMIC DATA

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*12 / 14  TULSA - ©TULS*

**TI**  -  HEAVY MINERALS AND PROVENANCE OF SANDS : MODELING OF LITHOLOGICAL END MEMBERS FROM RIVER SANDS OF NORTHERN AUSTRIA AND FROM SANDSTONES OF THE AUSTROALPINE GOSAU FORMATION (LATE CRETACEOUS)

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*13 / 14  TULSA - ©TULS*

**TI**  -  REGIONAL SOURCE ROCK MAPPING USING SOURCE POTENTIAL RATING INDEX

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*14 / 14  TULSA - ©TULS*

**TI**  -  A STUDY OF THE TIME VARIANT CHARACTER OF SOURCE SIGNATURES IN BOREHOLES  ·

<div align="center">Query/Command : prt 5 11 fu</div>

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*5 / 14  TULSA - ©TULS*

**AN**  -  712847

**TI**  -  SEISMIC VELOCITY ANALYSIS FOR MATURITY ASSESSMENT: UPPER ASSAM BASIN, INDIA

**AU**  -  MALLICK, R K; RAJU, S V; GOGOI, K D

**OS**  -  OIL INDIA LTD; DIBRUGARH UNIV

**SO**  -  J GEOPHYS (INDIA) V 19, NO 2, PP 91-100, APRIL 1998 (15 REFS)

**NU**  -  ISSN 02571412

**LA**  -  ENGLISH; (ENG)

**IT**  -  INDIA*; ASIA*; ASSAM BASIN*; CALCULATING*; DIAGENESIS*; EURASIA*; EXPLORATION*; GEOPHYSICAL EXPLORATION*; MATHEMATICS*; MATURATION*; OIL AND GAS ORIGIN*; POST DEPOSITIONAL PROCESS*; SEISMIC EXPLORATION*; SEISMIC REFLECTION METHOD*; SEISMIC VELOCITY COMPUTATN*; SOURCE ROCK*; ALTERATION; BARAIL SANDSTONE; BARAIL SERIES; BASEMENT ROCK; BASIN; BASIN DEVELOPMENT; BASIN STUDY; BURIAL HISTORY; CENOZOIC; CHART; CHEMISTRY; COMPACTION (GEOLOGY); CONTINENT; CONTINENTAL MARGIN; CONTINENTAL

SHELF FACIES; CORRELATION; CROSS SECTION; DATA; DELTAIC DEPOSIT; DEPOSIT (GEOLOGY); DEPOSITIONAL ENVIRONMENT; DEPTH; DIRECT HYDROCARBON INDICTR; EARTH AGE; EARTH STRUCTURE; ELASTIC WAVE LOGGING; ENVIRONMENT; EOCENE; EQUATION; FACIES; FORELAND BASIN; GEOCHEMICAL INTERPRETATION; GEOCHEMICAL MAP; GEOCHEMISTRY; GEOLOGIC CROSS SECTION; GEOLOGIC EXPLORATION; GEOLOGIC MAPPING; GEOLOGIC STRUCTURE; GEOLOGY; GRAPH; HYDROCARBON POTENTIAL; INDEX MAP; INTERMONTANE BASIN; INTERPRETATION; KOPILI FM; LAKADONG LIMESTONE; LAKE; LANGPAR FM; MAP; MAPPING; MARINE DEPOSIT; MARINE ENVIRONMENT; MIOCENE; NATURAL EARTH PHENOMENON; NEOGENE; OIL AND GAS ENTRAPMENT; OIL AND GAS FIELDS; OIL AND GAS MAP; OIL PRODUCING; OIL RESERVOIR; OLIGOCENE; ORGANIC DIAGENESIS; ORGANIC GEOCHEMISTRY; PALEOCENE; PALEOGENE; PETROLIFEROUS BASIN; PETROLOGY; PHANEROZOIC; PHYSICAL PROPERTY; PLATE TECTONICS; PRESSURE; PRODUCING; REFLECTION; RESEARCH; RESERVOIR; ROCK; SEISMIC CORRELATION; SEISMIC MAPPING; SEISMIC STRATIGRAPHY; SEISMIC VELOCITY; SONIC LOGGING; STRATIGRAPHY; STRUCTURAL GEOLOGY; STUDY; SUBSURFACE PRESSURE; SUBSURFACE TEMPERATURE; SYLHET LIMESTONE; TECTONICS; TEMPERATURE; TERRIGENOUS DEPOSIT; TERTIARY PERIOD; THERMAL ALTERATION; THERMAL PROPERTY; TIPAN SERIES; TRAP (GEOLOGY); UNCONFORMITY; UPLIFT; UPWARP; VELOCITY; VITRINITE REFLECTANCE; WAVE PHENOMENON; WAVE PROPAGATION; WAVE VELOCITY; WELL DATA; WELL LOGGING

**MH** - INDIA*

**CC** - GEOPHYSICS

**AB** - The Upper Assam foreland basin is an important onshore petroliferous region of India with reservoir rocks ranging in age from upper Paleocene to Miocene. Significant source rock intervals are found in the upper Paleocene-lower Eocene Sylhet Formation and upper Eocene-Oligocene Barail Formation. In a previous study, the thermal maturity of source rocks obtained from measurement of vitrinite reflectance were **compared** with sonic log derived maturity. The relationship can be expressed mathematically, in simple terms. In the present study, the method has been extended to thermal maturity evaluation from seismic velocity analysis. A good correlation has been obtained between maturity from seismic data and measured/calculated vitrinite reflectance values. This has enabled construction of thermal maturity map for the entire study area. The use of seismic velocity analysis is simple, reliable, and does not entail any additional expenditure. It also has the advantage of providing preliminary **estimates** of **source** rock maturity in undrilled areas of the basin.

**PY** - 1998

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*11 / 14  TULSA - ©TULS*

**AN** - 440223

**TI** - AIRGUN SIGNATURE ESTIMATION AND WAVELET PROCESSING OF

MARINE SEISMIC DATA

**AU** - LI, Y; SENGBUSH, R L

**OS** - CHINA NAT OFFSHOR OIL CORP; COLORADO SCH MINES

**SO** - 20TH ANNU SPE ET AL OFFSHORE TECHNOL CONF (OTC 88) (HOUSTON, 88.05.02-05) PROC V 1, PP 235-242, 1988 (OTC-5643; 11 REFS)

**LA** - ENGLISH; (ENG)

**DT** - (AT) MEETING PAPER TEXT

**IT** - SEISMIC DATA PROCESSING*; AIR GUN*; ARRAY*; DATA PROCESSING*; EXPLORATION*; GEOPHYSICAL EXPLORATION*; MARINE EXPLORATION*; PATTERN*; PHYSICAL PROPERTY*; SEISMIC EXPLORATION*; SEISMIC REFLECTION METHOD*; SEISMIC WAVE SOURCE*; WAVE PROPERTY*; WAVE SOURCE*; WAVEFORM*; ALGORITHM; AMPLITUDE; BAND PASS FILTER; CHART; CONTINENT; CONTINENTAL MARGIN; CONTINENTAL SHELF; CORRELATION; DATA; DECONVOLUTION; EARTH STRUCTURE; ELASTIC WAVE; ELECTRICAL EQUIPMENT; ELECTRONIC EQUIPMENT; EQUATION; FILTER (ELECTRICAL); GEOLOGY; GEOPHYSICAL DATA; GRAPH; MATHEMATICAL ANALYSIS; MATHEMATICAL GEOLOGY; MATHEMATICS; NOISE; RAY PATH; REFLECTION COEFFICIENT; SEISMIC DATA; SEISMIC WAVE; SEISMIC WAVE PATH; SIGNAL TO NOISE RATIO; TABLE (DATA); WAVE; WAVE AMPLITUDE; WAVE FRONT; WAVE PATTERN; WAVE PHENOMENON

**MH** - SEISMIC DATA PROCESSING*

**CC** - GEOPHYSICS

**AB** - THIS NEW TECHNIQUE ESTIMATES THE AIRGUN ARRAY SIGNATURE DIRECTLY FROM MARINE SEISMIC DATA AND USES THAT ESTIMATE TO PHASE COMPENSATE THE DECONVOLUTED DATA, FOLLOWED BY A BANDLIMITING FILTER MATCHED TO THE **ESTIMATED SOURCE** SIGNATURE. THE ARRAY SIGNATURE IS SIMULATED BY A GAUSSIAN- DAMPED SINE FUNCTION, AND THE SIGNATURE ESTIMATE IS BASED ON THE SUPERPOSITION OF ARRIVALS OF THIS FUNCTION ALONG ALL POSSIBLE PRIMARY AND MULTIPLE RAYPATHS, TAKING INTO ACCOUNT SPHERICAL DIVERGENCE AND ZOEPPRITZ REFLECTIVITY IN EACH PATH. PARAMETERS IN THE SIMULATED SIGNATURE, FREQUENCY, PHASE AND DAMPING, ARE ITERATED UNTIL AN OPTIMAL MATCH IS OBTAINED BETWEEN THE SIMULATED FIRST ARRIVALS AND THE ACTUAL FIRST ARRIVALS IN THE SEISMIC DATA. THE VALIDITY OF THE GAUSSIAN-DAMPED SINE WAVE AS THE FORM OF THE SIGNATURE IS VERIFIED BY **COMPARING** THE ESTIMATE WITH THE ACTUAL SIGNATURE RECORDED IN DEEP WATER, WITH THE CORRELATION COEFFICIENT BETWEEN THEM BEING 0.97.

**PY** - 1988

**Query/Command : his**

File : TULSA

SS    Results

```
 1        18   ..INDEX /Aun
                BLANCH, J O
 2     19893   7
 3         0   SS 7
 4         8   ESTIMAT??? 1W  SOURCE 1W WAVE????
 5         0   1 FU
 6         0   COMPAR???? 2D ESTIMAT??? 2D SOURCE 2D WAVE????
 7         4   COMPAR???? S ESTIMAT??? S SOURCE S WAVE????
 8        20   COMPAR??? S ESTIMAT??? S SOURCE
 9       170   ESTIMAT??? 3W SOURCE
10     27550   COMPAR???
11        19   9 AND   10
12        28   4 OR    8
13        14   11 NOT  12
```

Search statement  14


**Query/Command : stop hold**



Session finished: 07 NOV 2003 Time 17:51:04

TULSA         - Time in minutes :  26,59
The cost estimation below is based on Questel's
standard price list
                          Estimated cost :    33.23 USD
Records displayed and billed   :      9
                          Estimated cost :     9.60 USD
Cost estimated for the last database search :    42.83 USD
Estimated total session cost              :    43.85 USD

Your session will be retained for 2 hours.

QUESTEL.ORBIT thanks you. Hope to hear from you again soon.